C. S. LOCKWOOD.

CAGE FOR TUBULAR ROLLS.

APPLICATION FILED DEC. 9, 1918.

1,307,262.

Patented June 17, 1919.

Fig. 1.

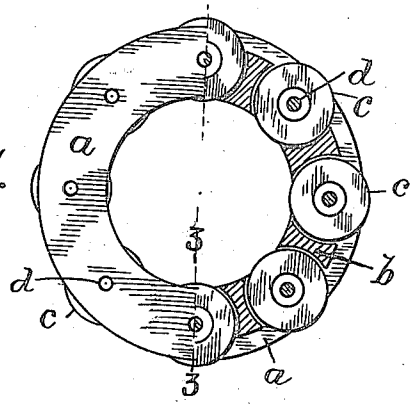


Fig. 2.

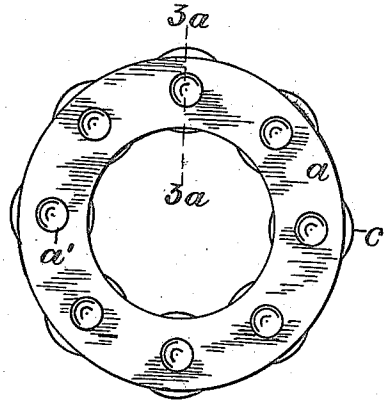


Fig. 4.



Fig. 5.

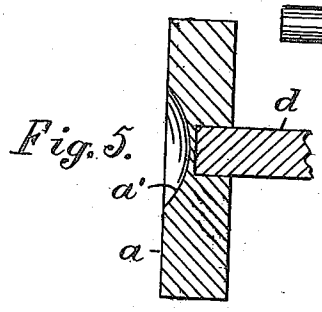
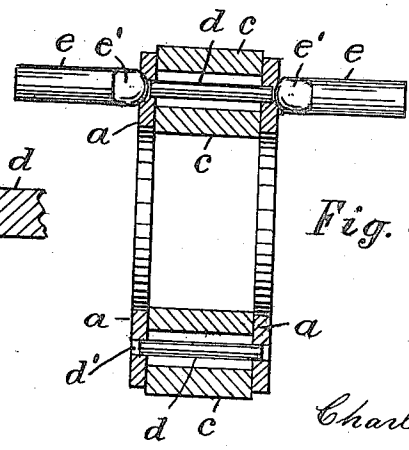


Fig. 3.



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BY

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CAGE FOR TUBULAR ROLLS.

1,307,262. Specification of Letters Patent. Patented June 17, 1919.

Application filed December 9, 1918. Serial No. 265,957.

To all whom it may concern:

Be it known that I, CHARLES S. LOCKWOOD, a citizen of the United States, residing at 496 Clinton avenue, Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Cages for Tubular Rolls, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a roll-cage in which the rolls are held and guided in their motion within a roller bearing.

In the present invention tubular rolls are employed and pivots are inserted through the heads and rolls to hold the rolls in place.

Heretofore such pivots have been headed over or riveted in the heads of the cage; and the object of the present invention is to avoid such riveting, and the strain consequent upon the crushing or riveting of the pivot-head, and the labor involved in heading such pivot separately.

Such mode of riveting is replaced in the present invention by making the pivots shorter than the distance through the cage, so that their opposite ends lie within the surface of the cage-heads, the metal of the heads around the pivot-holes being spun or pressed into the pivot-holes over the ends of the pivots to lock them in the cage-heads.

Means for spinning the metal into the required position is shown herein, and avoids all the strain involved in heading over the ends of the pivots upon the outer sides of cage-heads; and spinning-tools can, by suitable mechanism, operate at the same time upon all the pivots in a cage, and, if desired, upon both ends of the same simultaneously.

The invention will be understood by reference to the annexed drawing, in which Figure 1, in the left side, shows a cage with the rolls and pivot in suitable position for securing permanently in place. The nearer cage-head is omitted in the right-hand side of Fig. 1, leaving the space-bars and pivots in section. Fig. 2 is a view of the complete roll-set with the pivots locked in the heads; and Fig. 3, in the lower part, is a section taken on line 3—3 in Fig. 1; and in the upper part a section on line 3^a, 3^a in Fig. 2. Fig. 4 is an edge view of the spinning-tool; and Fig. 5 is an enlarged view of the head and pivot in section on line 3^a, 3^a in Fig. 2.

The cage-heads *a* are shown connected by integral ties *b*, the same in number as the rolls in the cage so as to form space-bars between the roll-sockets.

The sides of the space-bars are concaved to clear the curved sides of the rolls, and the sockets between the space-bars are of suitable width to permit the insertion of the rolls into their sockets from the outer side of the cage.

The rolls *c* in this invention are tubular, as shown at the right-hand of Fig. 1, and are held in place by pivots *d* which are made somewhat shorter than the length of the entire cage over both heads. The ends of the pivots rest in the heads, but the heads extend beyond the ends of the pivots, as shown in the upper part of Fig. 3.

The metal of the heads around the pivot-holes may therefore be pressed inwardly, as shown in the upper part of Fig. 4, and crowded over the ends of the pivots, thus locking them within the heads.

As the cage-heads are spaced apart and firmly connected by the bars *b*, the pivots have no longitudinal strain and serve simply to hold the rolls in the cage when handling or transporting the same.

The pressing of the metal inwardly is effected with the most rapidity and the least strain by means of spinning tools, such as are shown at *e* in Fig. 4, having a flat bit *e'* with rounded edge at the working end which is curved to form a countersink *a'* around and over the pivot-hole *d'*, as shown in Fig. 5, but without removing any metal from the bead.

Such spinning tools are rotated at suitable speed and a gang or assemblage of such tools may be suitably mounted to operate upon opposite heads simultaneously, as shown in the upper part of Fig. 3, and upon all of the pivot-holes simultaneously, if desired.

The enlarged view of the joint between the head and pivot, in Fig. 5, shows clearly the crowding of the metal around the pivot-hole toward the center of the hole so as to force it over the end of the pivot and lock the same in the head.

Any tool may be used that is adapted to press upon the metal around the pivot-hole and force it inwardly over the pivot-end.

It will be obvious from inspection of Fig. 5 that the connection between the heads and

the pivots does not form any projection upon the outer surface of the head nor require any mechanical treatment to finish the outer sides of the head after the rolls and the pivots are secured in the cage.

Where the ends of the pivots are riveted upon the heads the head commonly requires a finishing treatment to level the ends of the pivots with the surface of the heads, and this is wholly avoided by the present invention.

Having thus set forth the nature of the invention what is claimed herein is:

1. The combination, with a cage having heads at opposite ends and a set of tubular rolls fitted movably between the heads, of pivots extended through the heads and the rolls and having their ends within the outer line of the heads, and the material of the heads around the pivot-holes crowded toward the said holes upon the outer sides of the heads to lock the pivots permanently in the heads.

2. The combination, with a cage having heads at opposite ends and connections securing the heads permanently together, of a set of tubular rolls fitted movably between the heads, and pivots extended through the heads and the rolls, and having their ends within the outer line of the heads and the material of the heads around the pivot-holes crowded toward the said holes upon the outer sides of the heads to lock the pivots permanently in the heads.

3. The combination, with a cage having heads with a set of tubular rolls fitted movably between the same, of tie-bars connecting the heads permanently between the rolls, pivots extended through the heads and the rolls and having their ends within the outer lines of the heads, and the metal around the holes at the ends of the pivots spun inwardly to lock the pivots permanently in the heads.

In testimony whereof I have hereunto set my hand.

CHARLES S. LOCKWOOD.